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(71) Applicant (for all designated States except US): **VESTAS  
WIND SYSTEMS A/S** [DK/DK]; Smed Sørensens Vej 5,  
DK-6950 Ringkøbing (DK).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DAMGAARD**,  
Søren [DK/DK]; Finlandsgade 17, DK-6950 Ringkøbing  
(DK). **HAARH**, Arne [DK/DK]; Fjordvang 16, DK-6950  
Ringkøbing (DK). **JENSEN**, Nils, **Bjørn** [DK/DK];  
Ludvig Schrøders Vej 5D, DK-6600 Vejlen (DK).

(74) Agent: **PATENTGRUPPEN APS**; Aosgården, Aaboul-  
varden 31, DK-8000 Aarhus C (DK).

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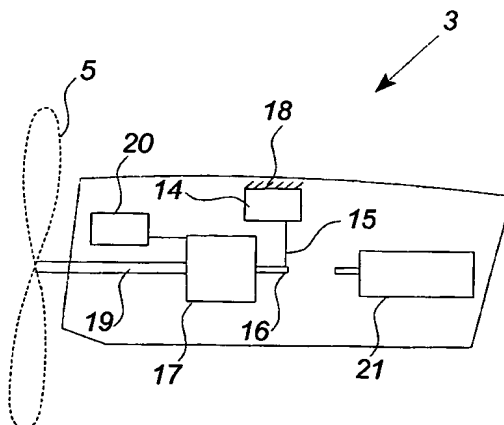
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For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: METHODS OF MOVING THE ROTATING MEANS OF A WIND TURBINE DURING TRANSPORTATION OR STAND STILL, METHOD OF CONTROLLING THE MOVING OF THE ROTATING MEANS, NACELLE, AUXILIARY DE-  
VICE, CONTROL AND MONITORING SYSTEM AND USE HEREOF



(57) Abstract: The invention relates to methods of moving the rotating means of a wind turbine during transportation or stand still. The methods may comprise the steps of: securing at least one auxiliary device to a position and connecting said device to one or more shafts of the rotating means at the transportation or stand still. The auxiliary device being able to store, generate and/or convert energy during transportation, transferring energy continuously from said at least one auxiliary device to said one or more shafts of the rotating means during transportation or stand still, and moving said one or more shafts of the rotating means continuously or discontinuously from a position to another. The invention also relates to a nacelle for a wind turbine, an auxiliary device, a control system for controlling the moving of the rotating means of a wind turbine nacelle during transportation of the nacelle and use hereof.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/DK 03/00196

**A. CLASSIFICATION OF SUBJECT MATTER**  
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According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F03D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 201 200 A (BERGISCHE STAHLINDUSTRIE) 24 August 1988 (1988-08-24) page 2, line 16 - line 19 page 4, line 17 - line 21 page 5, line 7 - line 10 ---	1-53
E	EP 1 336 755 A (VESTAS WIND SYSTEMS AS) 20 August 2003 (2003-08-20) page 4, line 4 - line 16 ---	1-53
E	WO 03 031812 A (HANSEN TRANSMISSIONS INTERNAT ; FLAMANG PETER (BE)) 17 April 2003 (2003-04-17) claim 6; figure 1 ---	1-53
A	DE 200 21 026 U (VOGEL FLUIDTEC GMBH) 29 March 2001 (2001-03-29) abstract; figure 1 -----	26,36,52

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

HELENE ELIASSON/JAA

# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date		Patent family member(s)	Publication date
GB 2201200	A	24-08-1988	DE	3702008 A1	04-08-1988
			SE	8800052 A	24-07-1988
-----					
EP 1336755	A	20-08-2003	EP	1336755 A1	20-08-2003
			WO	03071130 A1	28-08-2003
-----					
WO 03031812	A	17-04-2003	GB	2382117 A	21-05-2003
			WO	03031812 A1	17-04-2003
-----					
DE 20021026	U	29-03-2001	DE	20021026 U1	29-03-2001
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